

DATA REPORT

Characterization of Shore Terminal Site LRT-S02 Sediment Core Samples for Total DDT

Prepared for

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April 2006

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1. INTRODUCTION

The Levin-Richmond Terminal Corporation (LRTC), located in the Richmond Inner Harbor Channel in Point Richmond, CA, (Figures 1-1 and 1-2), is currently seeking a 10-year permit from the U.S. Army Corps of Engineers (USACE), and 5-year permits from the Bay Conservation and Development Commission (BCDC) and San Francisco Bay Regional Water Quality Lab Control Board (RWQCB) for maintenance dredging of their berth areas.

The results of recent sediment characterization for proposed dredging by the LRTC have been submitted under separate cover (PER 2006). Based on the measured Total DDT concentration of 138 µg/kg reported for the LRT-S02 sediment composite sample (PER 2006) and at the clients request, each sediment core that comprised the composite sample was subsequently analyzed to determine if the reported total DDT concentration was representative of DDT concentrations throughout the berth area, or was the result of a localized "hot spot". The locations at which the individual sediment cores were collected are presented in Figure 1.3. Results of the follow-up analysis of DDT for the individual sediment core samples are presented below in Section 2.

2. LABORATORY ANALYSES RESULTS

The individual sediment core samples were analyzed for total DDT as specified in the SAP (PER 2005). The results of these analyses are summarized in Table 2-1. The full Data Report for the analyses that was submitted by the contracting analytical laboratory is provided in Appendix A.

Total DDT was detected in each of the sediment core samples, with measured concentrations ranging from 140-290 µg/kg.

Table 2-1. Total DDT concentrations (µg/kg, dry wt.) of Shore Terminal LRT-S02 sediment core samples

Analyte	LRT-S02-01	LRT-S02-02	LRT-S02-03	LRT-S02-04	LRT-S02-05	Method Reporting Limit
4,4'-DDD	160	180	87	120	85	20
4,4'-DDE	31	35	21	26	33	20
4,4'-DDT	49	75	32	24	36	20
Total DDT	240	290	140	170	154	NA

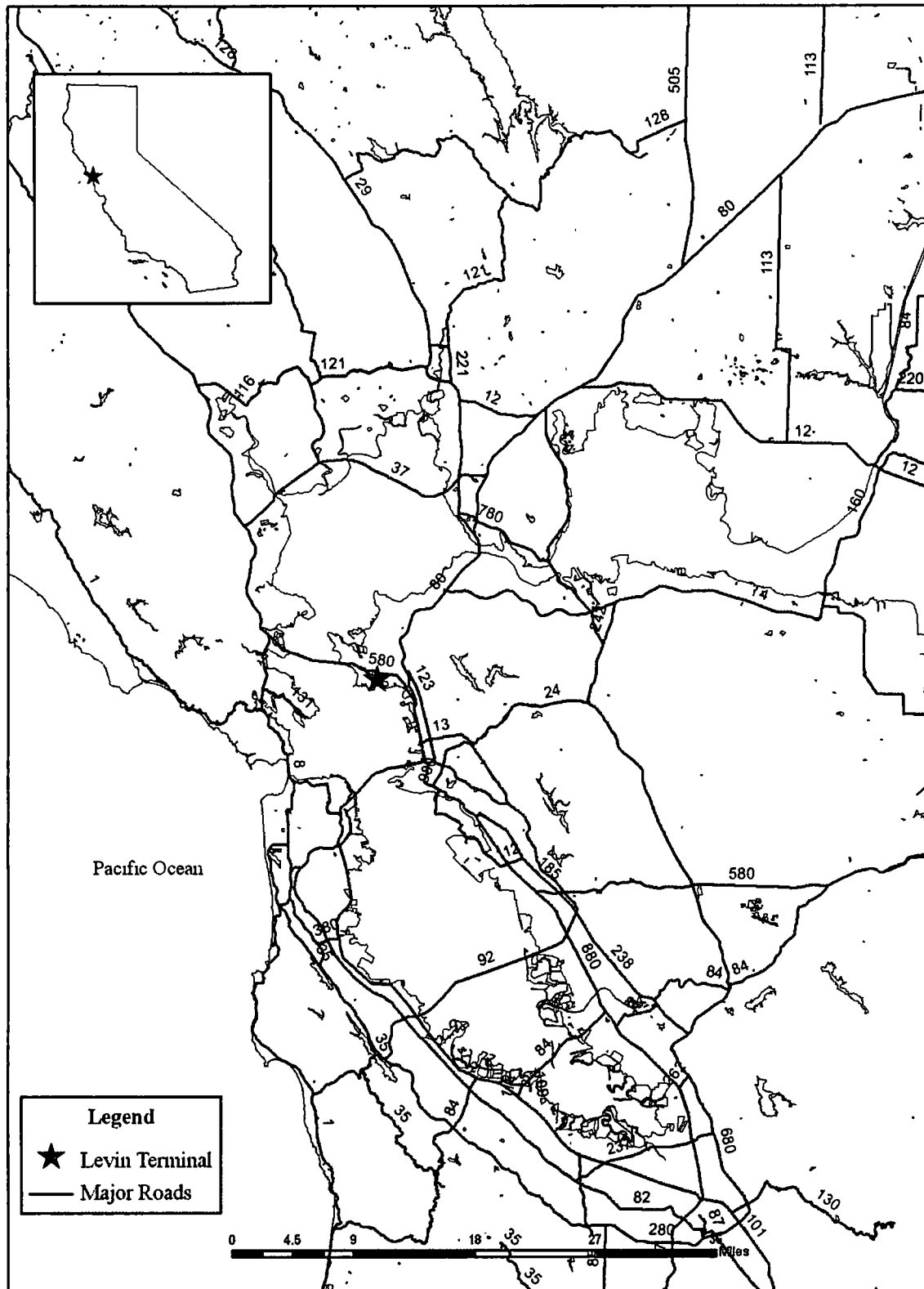
Should have analysed both 2,4' and 4,4'

2.1 Chemical Analytical QA/QC Summary

The QA/QC review entailed reviewing the contract lab Data Report for sample integrity, correct methodology, documentation of instrument calibration, and compliance with all appropriate quality Lab Control requirements. Although there were matrix spike recovery exceedances for

Total DDT, the overall data quality assessment found that all data were usable. Appendix B contains the chemical analysis reports, which include contract laboratory QA/QC narratives; a brief summary of this narrative is presented below.

Analysis of Total DDT –The method reporting limits have been raised due to the presence of elevated levels of the target analyte. The reporting limits were adjusted to reflect the dilution. Matrix spike recoveries and matrix spike recoveries were not applicable due to the elevated concentration of analyte in the sample: the analyte concentration was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery. All other QA parameters were within acceptable ranges.



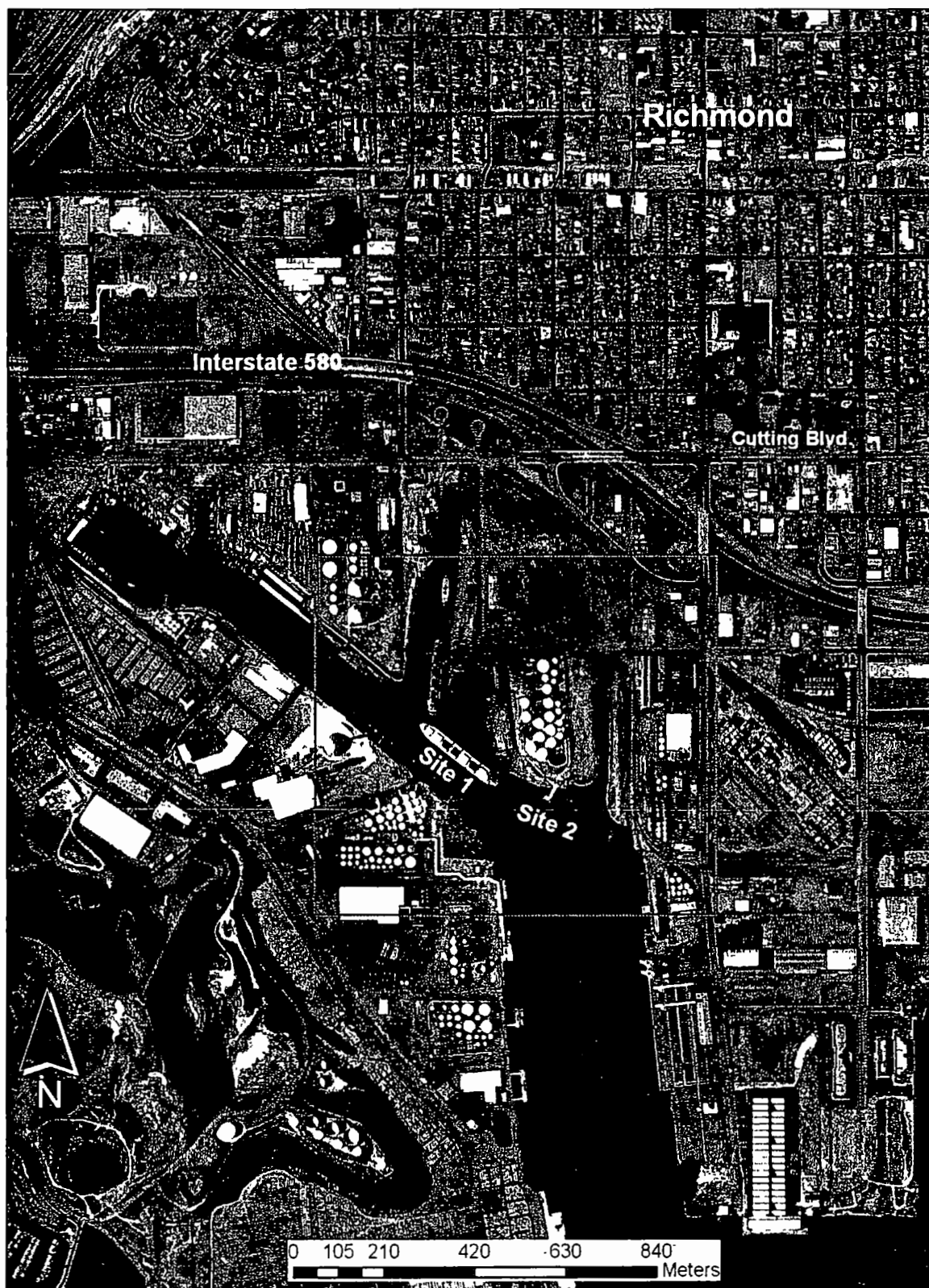


Figure 1-2. Vicinity Map: Shore Terminal

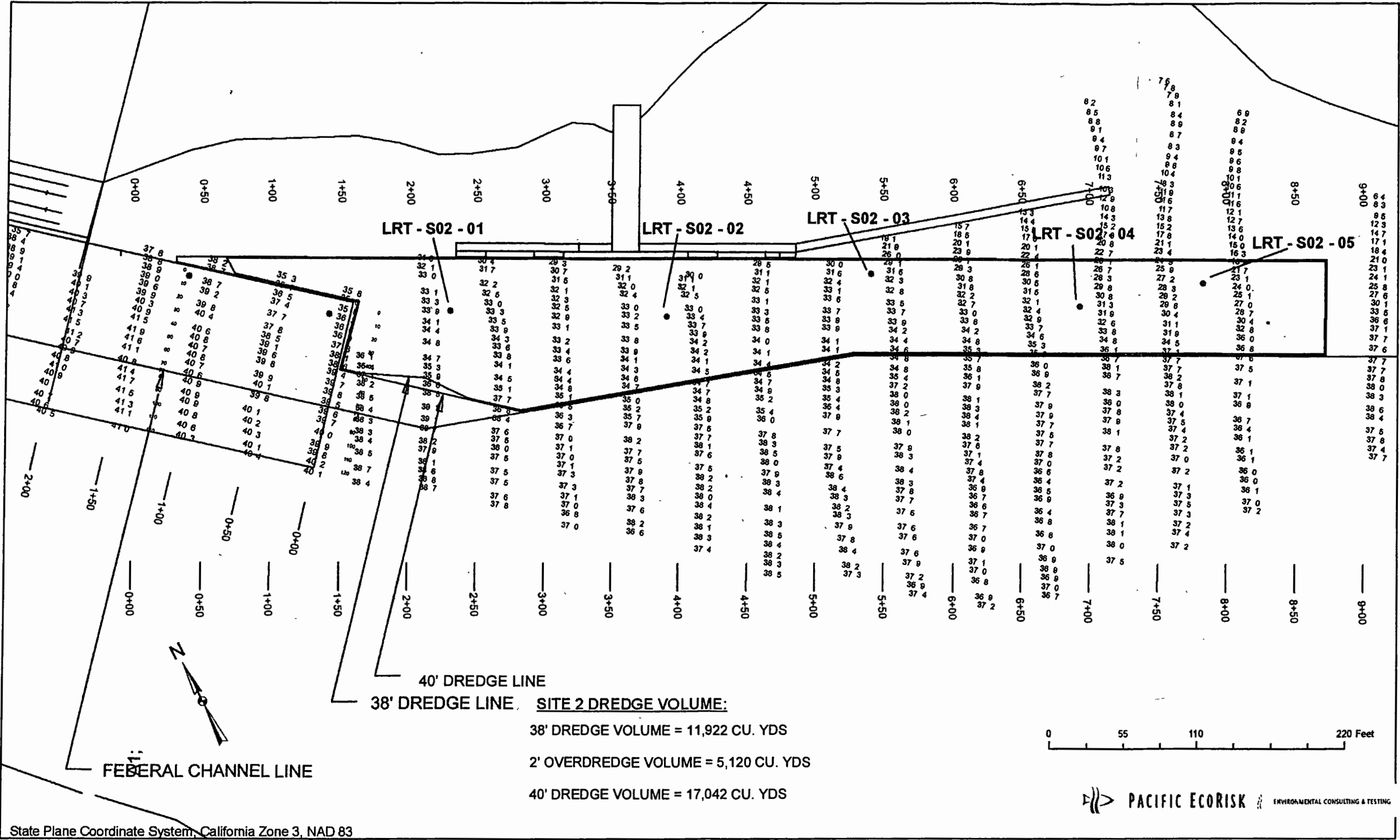


Figure 1-3. Site LRT-S02 (Shore Terminal) Sediment Core Locations

3. REFERENCES

PER 2006. Characterization of Levin Richmond Terminal Sediments: Results of Dredge Materials Sampling and Analysis. Pacific EcoRisk, Martinez, CA.

PER 2005. Sediment Characterization Sampling and Analysis Plan for the Levin Richmond Terminal. Pacific EcoRisk, Martinez, CA.

Appendix A

Analytical Chemistry Laboratory Data Report

April 18, 2006

Service Request No: K0601282B

Jeffrey Cotsifas
Pacific Eco-Risk Laboratories
835 Arnold Dr.
Suite 104
Martinez, CA 94553

RE: Levin Terminal

Dear Jeffrey:

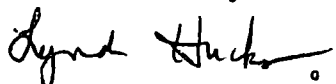
Enclosed is the revised report for the sample(s) submitted to our laboratory on February 16, 2006. For your reference, these analyses have been assigned our service request number K0601282B.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3358.

Respectfully submitted,

Columbia Analytical Services, Inc.


Lynda Huckestein
Client Services Manager

LH/afs

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- B The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.
- * The duplicate analysis not within control limits. See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- i The MRL/MDL has been elevated due to a chromatographic interference.
- X See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Pacific Eco-Risk Laboratories
Project: Levin Terminal
Sample Matrix: Sediment

Service Request No.: K0601282B
Date Received: 2/16/2006

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Five LRT-S02 sediment samples were received for analysis at Columbia Analytical Services on 2/16/2006. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored frozen at -20°C upon receipt at the laboratory.

Organochlorine Pesticides by EPA Method 8081A

Continuing Calibration Verification Exceptions:

The primary evaluation criterion was exceeded for the following analytes in Continuing Calibration Verification (CCV) 0303F042, 0303F061, 0303F078: Decachlorobiphenyl. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard meets the alternative evaluation criteria.

Results for the following analytes: Decachlorobiphenyl in all samples have been reported from a column using average percent recovery of all analytes in the verification standard.

Sample Confirmation Notes:

The confirmation comparison criteria of 40% difference for a few analytes were exceeded in most samples. The higher of the two values is reported when no evidence of a peak anomaly was observed. The lower of the two values was reported when an apparent interference on the alternate column produced the higher value.

Elevated Method Reporting Limits:

The reporting limit is elevated for several analytes in all samples. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compounds at the reporting limit. The results are flagged to indicate the matrix interference.

Most samples required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Matrix Spike Recovery Exceptions:

The control criteria for matrix spike recoveries of analytes gamma-Chlordane, 4,4'-DDE, 4,4'-DDD, 4,4'-DDT for sample Batch QCMS and analytes 4,4'-DDD, 4,4'-DDT in sample Batch QCDMS, are not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

Approved by lmt Date 4/18/06

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific Eco-Risk Laboratories
Project: Levin Terminal
Sample Matrix: Sediment

Service Request: K0601282B
Date Collected: 10/17/2005
Date Received: 02/16/2006

Organochlorine Pesticides

Sample Name: LRT-S02-01
Lab Code: K0601282-006
Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
4,4'-DDE	31	P	1.0	1	02/24/06	03/04/06	KWG0603157	
4,4'-DDD	160	D	20	20	02/24/06	03/06/06	KWG0603157	
4,4'-DDT	49	D	20	20	02/24/06	03/06/06	KWG0603157	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	85	38-125	03/04/06	Acceptable
Decachlorobiphenyl	68	26-166	03/04/06	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific Eco-Risk Laboratories
Project: Levin Terminal
Sample Matrix: Sediment

Service Request: K0601282B
Date Collected: 10/17/2005
Date Received: 02/16/2006

Organochlorine Pesticides

Sample Name: LRT-S02-02
Lab Code: K0601282-007
Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
4,4'-DDE	35	P	1.0	1	02/24/06	03/04/06	KWG0603157	
4,4'-DDD	180	D	20	20	02/24/06	03/06/06	KWG0603157	
4,4'-DDT	75	D	20	20	02/24/06	03/06/06	KWG0603157	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	84	38-125	03/04/06	Acceptable
Decachlorobiphenyl	70	26-166	03/04/06	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific Eco-Risk Laboratories
Project: Levin Terminal
Sample Matrix: Sediment

Service Request: K0601282B
Date Collected: 10/17/2005
Date Received: 02/16/2006

Organochlorine Pesticides

Sample Name: LRT-S02-03
Lab Code: K0601282-008
Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
4,4'-DDE	21	P	1.1	1	02/24/06	03/04/06	KWG0603157	
4,4'-DDD	87	D	11	10	02/24/06	03/06/06	KWG0603157	
4,4'-DDT	32		1.1	1	02/24/06	03/04/06	KWG0603157	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	82	38-125	03/04/06	Acceptable
Decachlorobiphenyl	66	26-166	03/04/06	Acceptable

Comments: _____

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific Eco-Risk Laboratories
Project: Levin Terminal
Sample Matrix: Sediment

Service Request: K0601282B
Date Collected: 10/17/2005
Date Received: 02/16/2006

Organochlorine Pesticides

Sample Name: LRT-S02-04
Lab Code: K0601282-009
Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
4,4'-DDE	26	P	1.0	1	02/24/06	03/04/06	KWG0603157	
4,4'-DDD	120	D	10	10	02/24/06	03/06/06	KWG0603157	
4,4'-DDT	24		1.0	1	02/24/06	03/04/06	KWG0603157	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	81	38-125	03/04/06	Acceptable
Decachlorobiphenyl	65	26-166	03/04/06	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific Eco-Risk Laboratories
Project: Levin Terminal
Sample Matrix: Sediment

Service Request: K0601282B
Date Collected: 10/17/2005
Date Received: 02/16/2006

Organochlorine Pesticides

Sample Name: LRT-S02-05
Lab Code: K0601282-010
Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
4,4'-DDE	33	P	1.0	1	02/24/06	03/05/06	KWG0603157	
1,4'-DDD	85	D	10	10	02/24/06	03/07/06	KWG0603157	
1,4'-DDT	36		1.0	1	02/24/06	03/05/06	KWG0603157	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	81	38-125	03/05/06	Acceptable
Decachlorobiphenyl	67	26-166	03/05/06	Acceptable

Comments: _____

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Pacific Eco-Risk Laboratories
Project: Levin Terminal
Sample Matrix: Sediment

Service Request: K0601282B
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG0603157-4
Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
4,4'-DDE	ND	U	0.40	1	02/24/06	03/04/06	KWG0603157	
4,4'-DDD	ND	U	0.40	1	02/24/06	03/04/06	KWG0603157	
4,4'-DDT	ND	U	0.40	1	02/24/06	03/04/06	KWG0603157	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	71	38-125	03/04/06	Acceptable
Decachlorobiphenyl	70	26-166	03/04/06	Acceptable

Comments: _____

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific Eco-Risk Laboratories
Project: Levin Terminal
Sample Matrix: Sediment

Service Request: K0601282B

Surrogate Recovery Summary
Organochlorine Pesticides

Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
LRT-S02-01	K0601282-006	85	68
LRT-S02-02	K0601282-007	84	70
LRT-S02-03	K0601282-008	82	66
LRT-S02-04	K0601282-009	81	65
LRT-S02-05	K0601282-010	81	67
Method Blank	KWG0603157-4	71	70
Batch QCMS	KWG0603157-1	81	71
Batch QCDMS	KWG0603157-2	83	58
Lab Control Sample	KWG0603157-3	80	76

Surrogate Recovery Control Limits (%)

Sur1 = Tetrachloro-m-xylene	38-125
Sur2 = Decachlorobiphenyl	26-166

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific Eco-Risk Laboratories
Project: Levin Terminal
Sample Matrix: Sediment

Service Request: K0601282B
Date Extracted: 02/24/2006
Date Analyzed: 03/04/2006

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K0601282-001
Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0603157

Analyte Name	Sample Result	Batch QCMS KWG0603157-1 Matrix Spike			Batch QCDMS KWG0603157-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
4,4'-DDE	49	81.1E	17.5	185 *	60.9E	17.5	70	35-146	28	50
4,4'-DDD	170	293E	17.5	679 #	217E	17.5	244 #	32-156	30	50
4,4'-DDT	86	166E	17.5	458 #	137E	17.5	293 #	31-161	19	50

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Pacific Eco-Risk Laboratories
Project: Levin Terminal
Sample Matrix: Sediment

Service Request: K0601282B
Date Extracted: 02/24/2006
Date Analyzed: 03/04/2006

Lab Control Spike Summary
Organochlorine Pesticides

Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0603157

Lab Control Sample KWG0603157-3 Lab Control Spike				
Analyte Name	Result	Expected	%Rec	%Rec Limits
4,4'-DDE	21.5	20.0	107	73-126
4,4'-DDD	21.4	20.0	107	74-130
4,4'-DDT	22.0	20.0	110	75-132

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00013

120601282

CHAIN OF CUSTODY RECORD

PACIFIC ECORISK

835 Arnold Drive, Suite 104
Martinez, CA 94553
(925)313-8080 fax: (925)313-8089

RESULTS TO:

Jeff Cotsifas

BILL TO:

Same

Attn:

Tel:

Attn:

Tel:

PROJECT:

Levin Terminal

ANALYSES REQUESTED

REMARKS

SAMPLE IDENTIFICATION

DATE

TIME

SAMPLE
MATRIXGRAB/
COMP.

CONTAINERS/TYPE

organic -
chlorine

LRT-S01-01

10/17/05

1441

Sed.

G

1 1500 mL

✓

LRT-S01-02

10/17/05

1424

Sed

G

1 1500 mL

✓

LRT-S01-03

10/17/05

1410

Sed

G

1 1500 mL

✓

LRT-S01-04

10/17/05

1343

Sed

G

1 1500 mL

✓

LRT-S01-05

10/17/05

1330

Sed

G

1 1500 mL

✓

LRT-S02-01

10/17/05

1210

Sed

G

1 1500 mL

✓

LRT-S02-02

10/17/05

11:22

Sed

G

1 1500 mL

✓

LRT-S02-03

10/17/05

10:36

Sed

G

1 1500 mL

✓

LRT-S02-04

10/17/05

0943

Sed

G

1 1500 mL

✓

LRT-S02-05

10/17/05

0833

Sed

G

1 1500 mL

✓

METHOD OF SHIPMENT:

FED X

X

UPS

HAND

OTHER

COMMENTS:

Contact Jeff Cotsifas with any questions

CODES:

RELINQUISHED BY: (SIGNATURE)

DATE

TIME

RECEIVED BY: (SIGNATURE)

DATE

TIME

PAGE #

2/15/06

14:00

W. K. APAYNEE CAS

2/16/06 1000

1 OF 1

White - Return w/sample

Yellow: - Keep for your records

7:000